Available online at www.sciencedirect.com

SCIENCE DIRECT®

Biochimica et Biophysica Acta 1658 (2004) 1

BIOCHIMICA ET BIOPHYSICA ACTA

BBA

www.bba-direct.com

Preface

The 13th European Bioenergetics Conference (EBEC 2004) to be held in Pisa (Italy) on August 21–26, 2004 is the second Conference of this series organized in Italy after the inaugural Conference held in Urbino in 1980. During these 24 years, Bioenergetics has achieved resounding successes, recognized by the granting of several Nobel Prizes that have profoundly modified its content.

The resolution at atomic level of the structures of most of the mammalian respiratory complexes and of several equivalent bacterial redox systems, as well as of all components of the oxygenic photosynthetic chain, is shifting the attention of bioenergeticists toward the intimate details of the mechanisms of electron transfer and of proton translocation. These studies already indicate the similarities in the structural solutions in different redox complexes and their basic functional analogies.

Crystallographic, biochemical, and biophysical studies are also progressively elucidating the structural and functional details of the ATP synthases, thereby explaining the coupling mechanisms within this extraordinary molecular machine. ATP synthase has now to be compared to other ion translocating ATPases of P- and V-type. These enzymes must also be considered in connection with other mechano-chemical energy transducers present in biological systems.

Moreover, the role of Bioenergetics is becoming central in cell biology, since ion homeostasis, particularly that of Ca^{2+}, and all controlled metabolisms can be properly active if ATP is present in the cell at the right concentration. Altered energy metabolism homeostasis can have dramatic effects on highly aerobic cells like those of brain, heart, and muscles as it can be clearly observed in mitochondrial pathologies. In a number of these, it can be demonstrated that reactive oxygen species overproduction and impairment of nitrogen monoxide synthesis occur. Moreover, the cellular cycle is also highly dependent on the energy state of the cell, and the mode of cell death, whether by necrosis or apoptosis, is a matter mostly involving mitochondria.

The results obtained from studies on the bioenergetics of cells from patients carrying mutations in genes coding for respiration or ATP synthase, or adenine nucleotide translocators, will provide valuable information on fundamental aspects of bioenergetics in eukaryotes.

The Scientific Program of the 13th EBEC has tried to keep pace with these enthusiastic developments of Bioenergetics. This special issue contains short reviews and original research articles by most of the invited speakers of EBEC 2004. It offers, therefore, a valuable and updated source of information to all scientists interested in Bioenergetics.

We wish to express our thanks to the staff of BBA for their patient and fruitful collaboration in the production of this special issue.

B. Andrea Melandri
Giancarlo Solaini*
Scuola Superoire de Studi Universit.,
e di Perfezionamen to S. Anna,
Via G. Carducci 40, Pisa 56127, Italy
E-mail address: gsolaini@sssup.it.
*Corresponding author. Tel.: +39 50 883 320;
fax: +39 50 883 215.

0005-2728/$ - see front matter © 2004 Published by Elsevier B.V.
doi:10.1016/j.bbabio.2004.07.001